

WHAT IS CLAIMED IS:

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A1
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1. A single-crystalline film having a molecular alignment order provided through phase transition from a liquid crystal phase.

Sub B1
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2. A single-crystalline film according to Claim 1, wherein the liquid crystal phase includes a lower order liquid crystal phase and a higher order liquid crystal phase.

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3. A single-crystalline film according to Claim 1, wherein the liquid crystal phase includes a smectic phase.

4. A single-crystalline film according to Claim 3, comprising a smectic liquid crystal material providing a uniform molecular alignment in a smectic layer.

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5. A single-crystalline film according to Claim 4, wherein the smectic liquid crystal material has a molecular structure which is symmetrical with respect to its molecular long axis.

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A2
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6. A process for producing a single-crystalline film, comprising:

a step of disposing a smectic liquid crystal

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material exhibiting a uniform molecular alignment in a smectic layer between a pair of boundaries having a thickness regulation function, and

a crystallization step of cooling and solidifying the smectic liquid crystal material through its smectic phase into a single-crystalline film.

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